Installing the Access Point

Installing an AP involves the following high-level tasks.

Unpacking the Package

Package Contents

Each AP package contains the following items:

- One CW9176D1 AP
- Default mounting brackets: Mounting brackets and clips (if selected when ordered)
- Cisco product documentation and pointer card

Unpacking the Access Point

Procedure

Step 1 Unpack and remove the access point and the selected mounting accessory kit from the shipping box.

Step 2 Return the packing material to the shipping container and save it for future use.

Step 3 Verify that you have received all the items you ordered. If any item is missing or is damaged, contact your Cisco representative or reseller for instructions.

Cisco Orderable Accessories

You can order the following accessories separately, from Cisco:

- AP-mounting brackets to mount the AP

Mounting Brackets	Description
AIR-AP-BRACKET-2-B0=	For electrical or network boxes above ceiling mounts
AIR-AP-T-RAIL-F=	Flush ceiling grid clip
AIR-CHNL-ADAPTER=	T-RAIL channel adapter

- Power injectors when Power over Ethernet (PoE) is not available

Power Supply	Description
CW-INJ-8	Meraki 802.3bt PoE injector Power Specifications: 60W, 10 Gbps Ethernet For more information, see power injector data sheet.
AIR-PWRINJ7=	Mid-span power injector AIR-PWRINJ7= when (PoE) is not available Power specifications: 50W, 56VDC For more information, see the power injector data sheet.
AIR-PWRINJ6=	[1] Power Specifications: 30W, 55VDC For more information, see the power injector data sheet.
MA-INJ-6-x	Meraki 802.3bt PoE injector Power Specifications: 60W, 55VDC For more information, see the power injector data sheet.

[1] If 802.3af is used, the system function will be disabled.

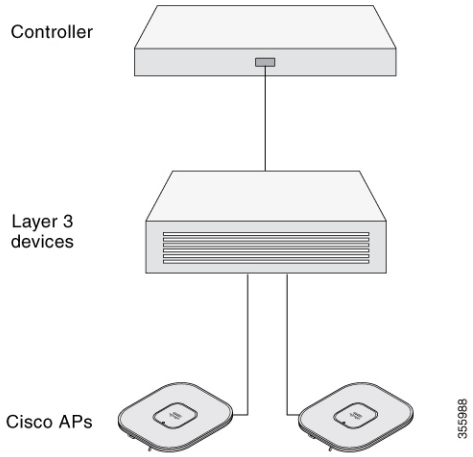
A 802.3at power injector when PoE is not available

Performing a Preinstallation Configuration

The following procedures describe the processes to ensure that your AP installation and initial operation go as expected.

Note Performing a preinstallation configuration is an optional procedure. If your network controller is properly configured, you can install your AP in its final location and connect it to the network from there. For more information, see Deploying the Access Point on a Wireless Network.

The following illustration shows the preinstallation configuration setup:



Perform the following steps:

Before you begin

Ensure that the Cisco Controller Distribution System (DS) port is connected to the network. Use the procedure for CLI or GUI, as described in the release-appropriate Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide.

- Enable Layer 3 connectivity between APs, Cisco Controller Management, and AP-Manager interface.
- Configure the switch to which your AP has to attach. See the Cisco Wireless Controller Configuration Guide for the release you are using, for additional information.
- Ensure that the DHCP is enabled on the network. The AP must receive its IP address through DHCP.

Note An AP is assigned an IP address from the DHCP server only if a default router (gateway) is configured on the DHCP server (enabling the AP to receive its gateway IP address) and the gateway ARP is resolved.

- CAPWAP UDP ports must not be blocked in the network.
- The AP must be able to find the IP address of the controller. This can be accomplished using DHCP, DNS, or IP subnet broadcast. This guide describes the DHCP method to convey the controller IP address. For other methods, see the product documentation. See also Configuring DHCP Option 43 for more information.

Note The AP requires an 10G Ethernet link to prevent the Ethernet port from becoming a bottleneck for traffic.

Procedure

Step 1 Power the AP using a supported power source.

See Powering the Access Point, on page 16.

- The AP checks for cloud connectivity and attempts to connect to the Meraki dashboard.
- If the AP is unable to find cloud connectivity, it uses fast offline migration to look for a Cisco Catalyst 9800 Controller. The AP uses DHCP, DNS, and L2 discovery mechanisms for the migration. For more information, see Global Use Access Points.

  Note
  The AP should not have cloud connectivity from its subnet if it intends to connect to a controller. If the AP joins a Meraki Dashboard, it can be later migrated to a controller.

Once the AP discovers the controller, it performs a firmware image download and reboots.

Step 2 If the preinstallation configuration is successful, the Status LED is green, indicating normal operation. Disconnect the AP and mount it on the location at which you intend to deploy it on the wireless network.

Step 3 If your AP does not indicate normal operation, turn it off and repeat the preinstallation configuration.

Note
When you are installing a Layer 3 access point on a subnet that is different from the Catalyst 9800 controller, ensure that the following setup is configured:

- A DHCP server is reachable from the subnet on which you plan to install the AP.
- The subnet has a route back to the controller.
- This route has destination UDP ports 5246 and 5247 open for CAPWAP communications.
- The route back to the primary, secondary, and tertiary controller allows IP packet fragments.
- If address translation is used, the access point and the controller have a static 1-to-1 NAT to an outside address. Port Address Translation is not supported.

Preinstallation Checks and Installation Guidelines

Before you mount and deploy your access point, we recommend that you perform a site survey (or use the Site Planning tool) to determine the best location to install your access point.

You should have the following information about your wireless network available:

- Access point locations
- Access point mounting options:
  - Below a suspended ceiling
  - on a flat surface
  - articulating on a pole/wall

Note You can mount the access point above a suspended ceiling, but you must purchase additional mounting hardware. For more information, see Mounting the Access Point, on page 6.

- Access point power options: Use either of the following options to power the AP:
  - Cisco-approved power injector
  - PoE with a supporting switch

Note
- The Underwriter Laboratories (UL)-approved Listed Power Adapter must meet the following minimum specifications: Rated output of 42.5 to 57 Vdc, min. 0.81-1.08A, Tma of 50°C minimum, altitude of 3048m minimum.
- If 802.3af is used, all the radios get switched off. Ethernet gets downgraded to 1 GbE. The Wi-Fi client serving radios and IoT radio are switched off.

- Operating temperature:
  - CW9176D1: 32°F to 122°F (0°C to 50°C)

Note When installing the AP in an environment where the ambient temperature is in the range of 104°and 122°F (>40° and 50°C), the access point configuration changes.
- 2/5/6, 802.3bt: 2G radio scales to 2x2, ethernet port link remains at 10G, and the USB remains enabled.
- 5/5/6, 802.3bt: 6G radio scales to 2x2, ethernet port link remains at 10G, and the USB remains enabled.
- 2/5/6, 802.3at: Radios scale to 2x2, ethernet port link remains at 10G, and the USB remains disabled.
- 5/5/6, 802.3at: Radios scale to 2x2, ethernet port link remains at 10G, and the USB remains disabled.

Note When the AP is powered by either DC power, UPoE, or 802.3bt power injector, it can operate with all its functions enabled until it reaches 122°F (50°C) temperature.

- Console access using the console port

  We recommend that you use a console cable that is one meter or less in length.

Note The AP may face issues while booting if you use an unterminated console cable (not plugged into any device or terminal) or a console cable that is more than one meter in length.

We recommend that you make a site map showing access point locations so that you can record the device MAC addresses from each location and return them to the person who is planning or managing your wireless network.

Mounting the Access Point

Cisco Wireless 9176D1 Wi-Fi 7 Access Point can be mounted in the following places:

- Suspended ceiling
- Hard ceiling
- Wall or pole
- Electrical or network box
- Above a suspended ceiling

For detailed instructions on mounting the AP, see the *Access Point Mounting Instructions* document at:

http://www.cisco.com/c/en/us/td/docs/wireless/access_point/mounting/guide/apmount.html.

The standard mounting hardware supported by the AP are listed in the following table.

Table 1: Brackets and Clips to Mount the AP

Mounting Type	Part Number	Description
Brackets[234]	AIR-AP-BRACKET-1	Low-profile bracket: Used for ceiling-mount installations.
	AIR-AP-BRACKET-2	Universal bracket: Used for wall or electrical box installations.

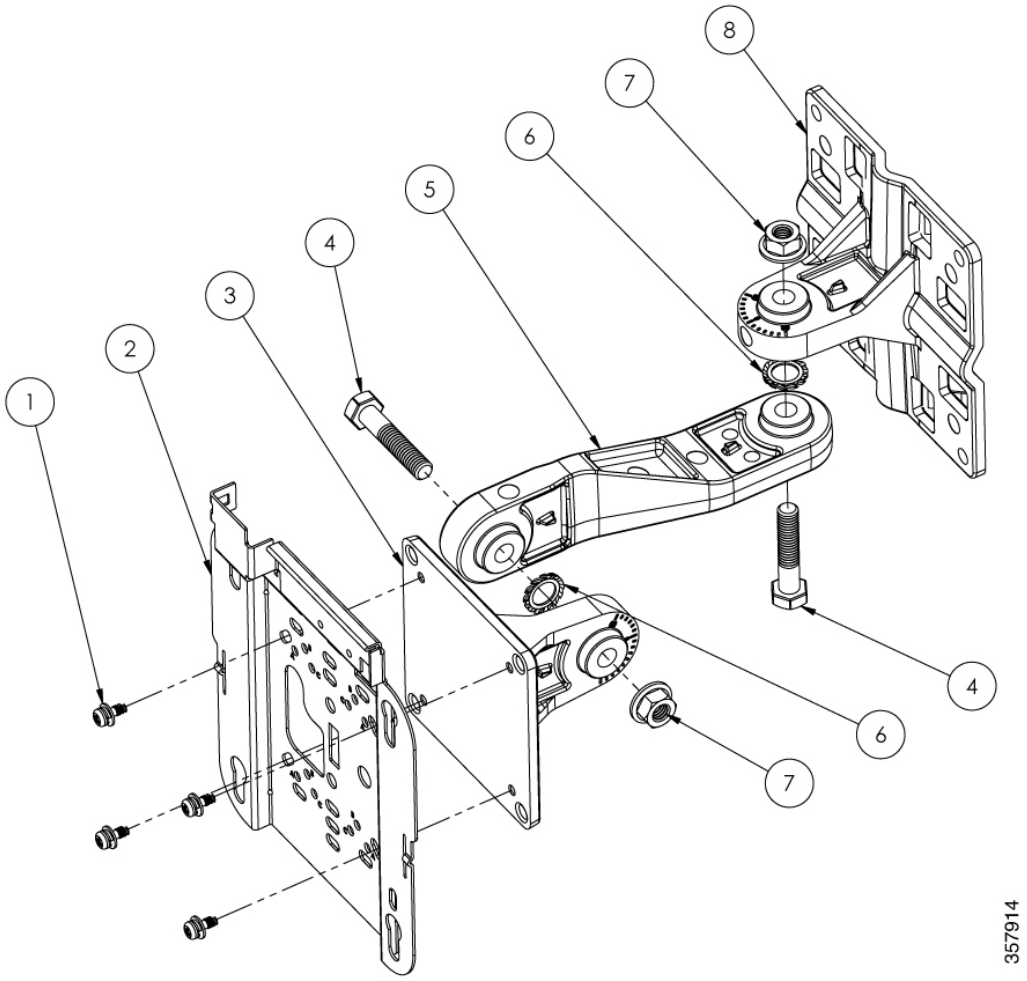
Mounting Type	Part Number	Description
Clips	AIR-AP-T-RAIL-R	Ceiling grid clip (recessed mounting). (This is the default option.)
	AIR-AP-T-RAIL-F	Ceiling grid clip (flush mounting).
	AIR-CHNL-ADAPTER	Optional adapter for channel-rail ceiling grid profile.
Desk mount	—	Desk mount rubber feet using screw size 8-32x.28”

[2] Mount the AP using no less than four screw holes on a bracket.
[3] AIR-AP-BRACKET-3 is not compatible for use with Cisco CW9176D1 access points.
[4] You can also use the *in-tile* mounting options available from third parties. For more information, see the access point data sheet.

When mounting the AP in areas where there is a possibility of the AP being knocked off the mounting bracket, use the lock hasp at the back of the AP to lock it to the bracket.

Mounting on a Wall or Ceiling Using Articulating Bracket

Figure 1: Exploded View of the Wall Mounting Articulating Bracket Hardware Assembly



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	M4 X 10mm screw with washer	4	Snug, hand tight
2	AIR-AP-BRACKET-2 Not included in this kit.	1	—
3	Access point bracket plate	1	—
4	M8 x40 Hex bolts	2	—
5	Mounting arm	1	—
6	M8 washer (external-tooth)	2	—

Item #	Mounting Bracket Kit	Quantity	Tightening Values
7	M8 flanged lock nut	2	5.6 lb-ft to 5.9 lb-ft (7.6 Nm to 8.0 Nm)
8	Pole or wall mounting flange	1	—

Figure 2: AIR-AP-BRACKET-2 Attachment to Access Point Bracket Plate

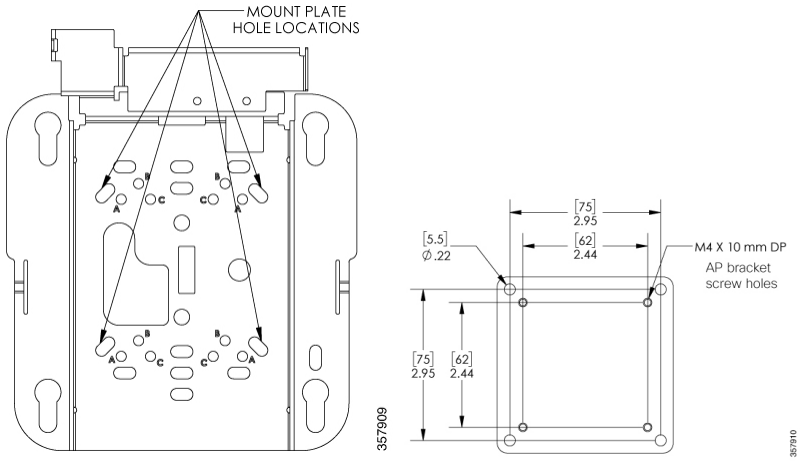


Figure 3: Wall Flange Mounting Holes

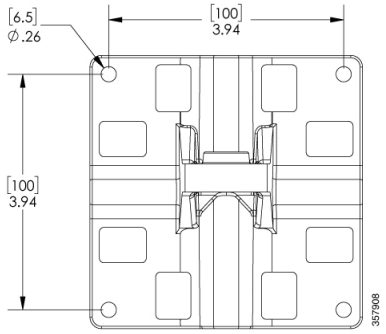
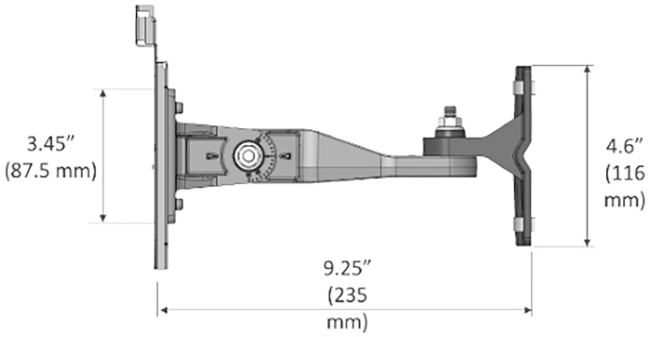


Figure 4: Articulating Bracket Dimensions



Procedure

Step 1 Determine the mounting location for the access point.

Step 2 Attach the wall mounting flange to the wall or ceiling using four M6 screws through the holes in the bracket.

Caution
The mounting wall, attaching screws, and wall anchors must support a 50-lb (22.7–kg) static weight.

Note
The mounting kit does not include the M6 screws for securing the bracket to the mounting surface.

Step 3 Attach the AIR-AP-BRACKET-2 to the access point bracket using four M4 screws through the holes in the bracket.

Hand tighten snug the four screws.

Step 4 Assemble the mounting arm to connect the access point bracket and the wall mounting flange.

Hand tighten all screws and nuts. See Figure 1: Exploded View of the Wall Mounting Articulating Bracket Hardware Assembly, on page 8

Step 5 Attach the access point to the AIR-AP-BRACKET-2.

Use a 13 mm wrench to loosen or tighten the fasteners at the azimuth and elevation- adjustment pivots.

Step 6 Adjust the access point's azimuth (side-to-side position) and elevation (up-and-down position).

Loosen the adjustment pivot nuts slightly to allow for adjustment. Use the azimuth and elevation markings on the articulating mounting arm and the flange brackets as a guide. You may adjust the azimuth angle up to ±60 degrees and elevation up to +60 / -90 degrees.

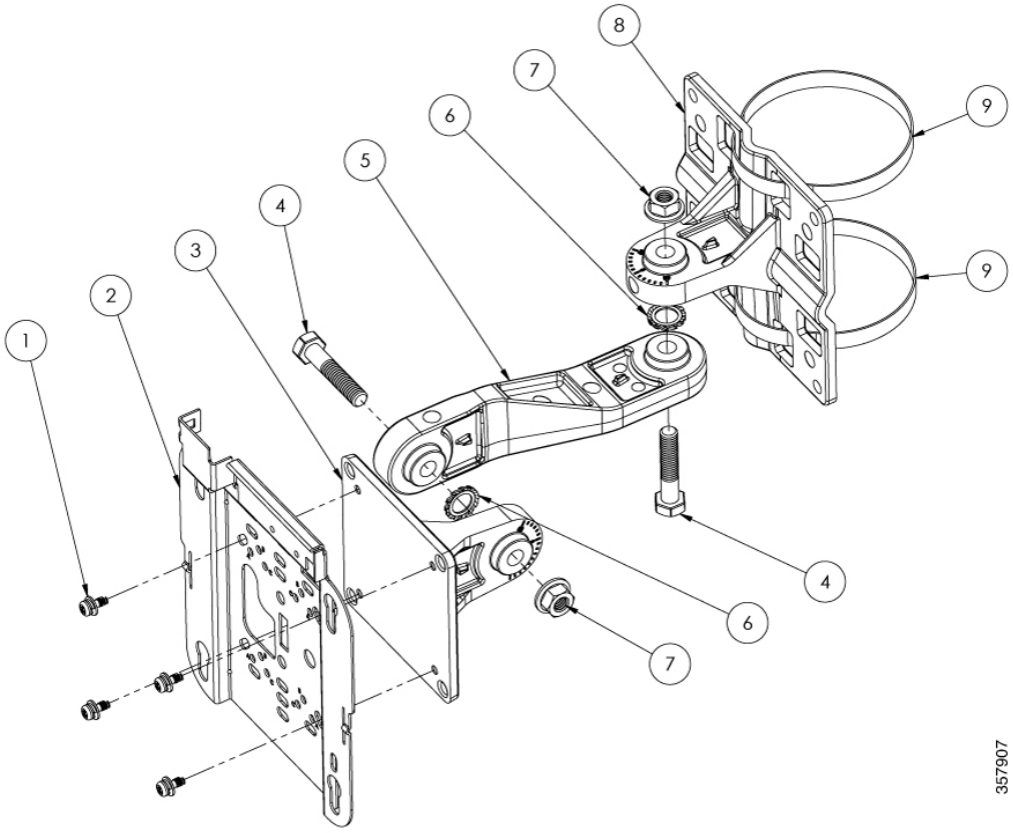
Step 7 After adjusting the access point position, tighten the pivot nuts.

Tighten all nuts at the pivot points to 5.6 lb-ft to 5.9 lb-ft (7.6 Nm to 8.0 Nm) torque.

Step 8 Connect the Ethernet cable to the access point.

Mounting on a Pole or Mast Using Articulating Bracket

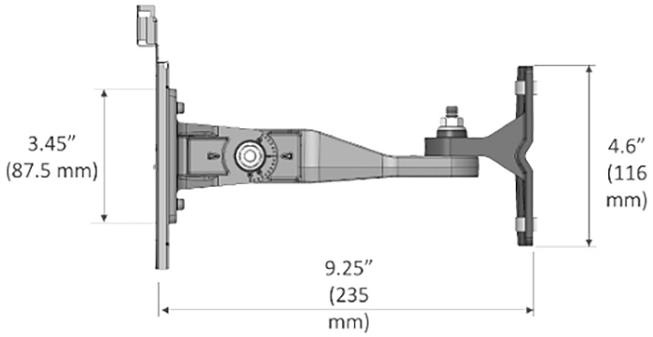
Figure 5: Exploded View of the Pole Mounting Articulating Bracket Hose Clamp Assembly



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	M4 X 10mm screw with washer	4	Snug, hand tight
2	AIR-AP-BRACKET-2 Not included in this kit.	1	—
3	Access point bracket plate	1	—
4	M8 x40 Hex bolts	2	—
5	Mounting arm	1	—
6	M8 washer (external-tooth)	2	—
7	M8 flanged lock nut	2	5.6 lb-ft to 5.9 lb-ft (7.6 Nm to 8.0 Nm)
8	Pole or wall mounting flange	1	—

Item #	Mounting Bracket Kit	Quantity	Tightening Values
9	Hose clamp 2.5" to 5" (63.5 to 127mm) diameter	2	—

Figure 6: Articulating Bracket Dimensions



Before you begin

Note The pole or mast must be rigid enough to hold the weight of an access point along with the associated forces produced by wind loads. In addition, the mast must be structurally strong enough to withstand the clamping force of the hose clamps.

Procedure

Step 1 Determine the mounting location for the access point on the pole or mast.

Step 2 Position and mount the pole mounting flange onto the pole or mast using the hose clamps provided in the kit.

The hose clamps should pass through the slots on the free mounting flange bracket.

Step 3 Tighten the hose clamps and set screws until the flange is fully secure on the mast.

Adjust the flange to its final position. Then, use a slotted screwdriver to tighten the screws on the hose clamps.

Step 4 Attach the AIR-AP-BRACKET-2 to the access point bracket using four M4 screws through the holes in the bracket.

Snugly hand tighten the M4 four screws included in the mounting kit.

Step 5 Assemble the mounting arm to connect the pole mounting flange and the access point bracket.

Hand tighten all screws and nuts. See Figure 5: Exploded View of the Pole Mounting Articulating Bracket Hose Clamp Assembly, on page 11.

Step 6 Attach the access point to the AIR-AP-BRACKET-2.

Note

Ensure that the access point cannot rotate about the pole.

Step 7 Adjust the azimuth (side-to-side position) and the access point's elevation (up-and-down position).

Loosen the adjustment pivot nuts slightly to allow for adjustment.

You can use the azimuth and elevation markings on the articulating mounting arm and the flange brackets as a guide. You can adjust the azimuth angle up to ±60 degrees and elevation up to +60 / -90 degrees.

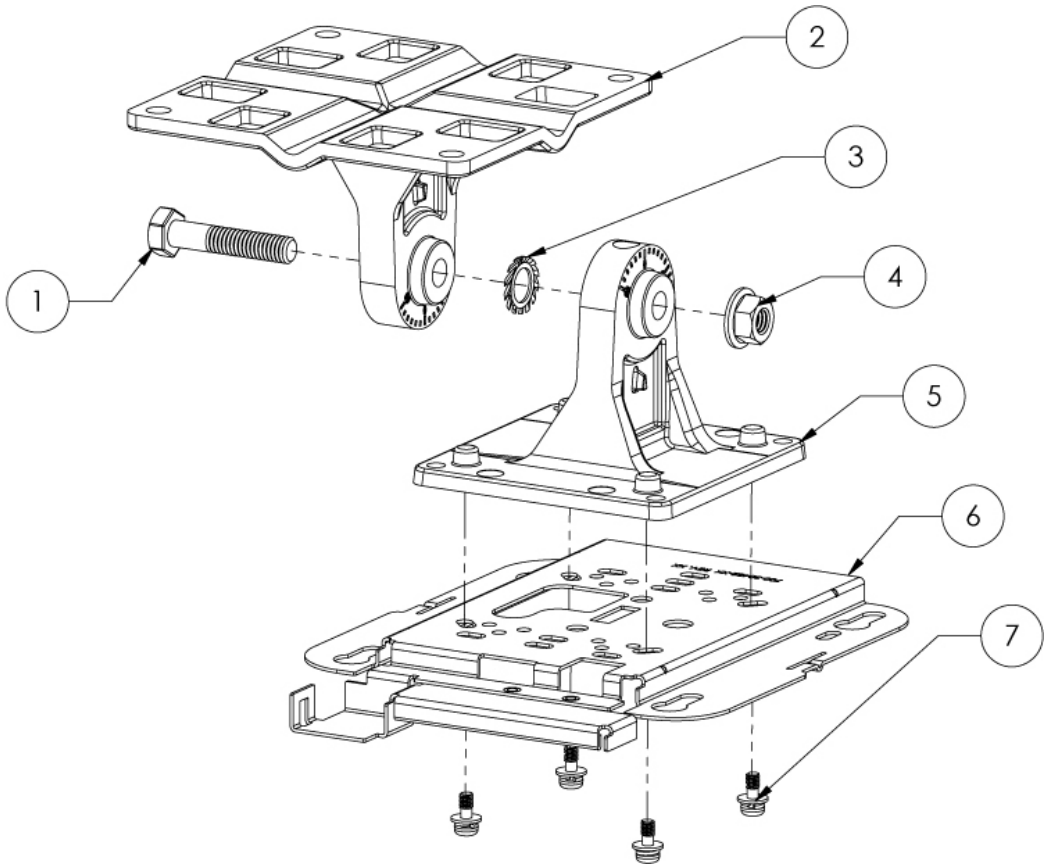
Step 8 After adjusting the access point's position, tighten all nuts at the pivot points to 5.6 lb-ft to 5.9 lb-ft (7.6 Nm to 8.0 Nm).

Step 9 Connect the Ethernet cable to the access point.

Mounting the Access Point Using Single Axis Articulating Bracket

Note The CW-MNT-ART2-00 mounting kit can be configured without the mounting arm. In this configuration, the kit provides a single-axis pivot adjustment of up to ±50 degrees.

Figure 7: Exploded View of the Single Axis Articulating Bracket Hardware Assembly



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	M8 x 40 mm Hex bolt	1	—
2	Pole or wall mounting flange	1	—
3	M8 Washer (external-tooth)	1	—
4	M8 Flanged lock nut	1	5.6 to 5.9 lb-ft (7.6 to 8.0 Nm)
5	Access point bracket plate	1	—
6	AIR-AP-BRACKET-2 Not included in this kit.	1	—
7	M4 X 10 mm screw with washer	4	Snug, hand tight

Figure 8: AIR-AP-BRACKET-2 Attachment to Access Point Bracket Plate

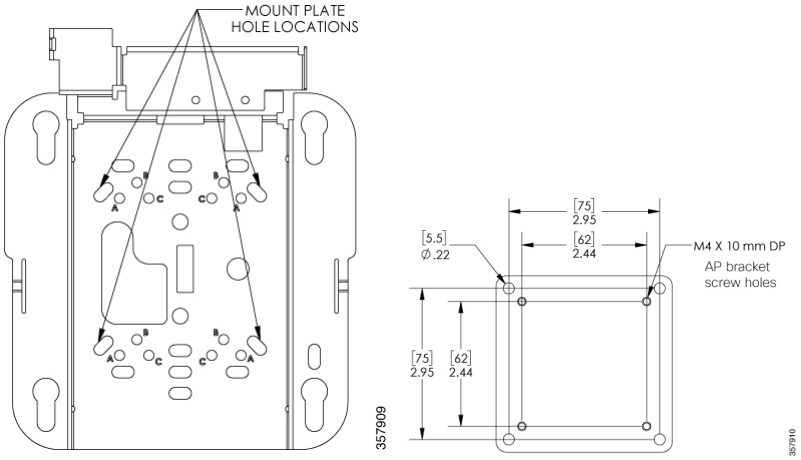


Figure 9: Wall Flange Mounting Holes

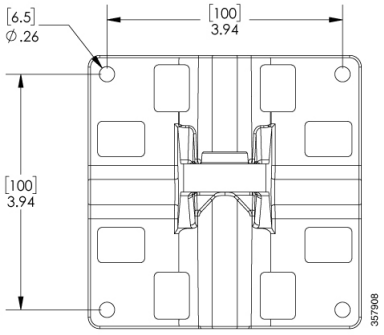
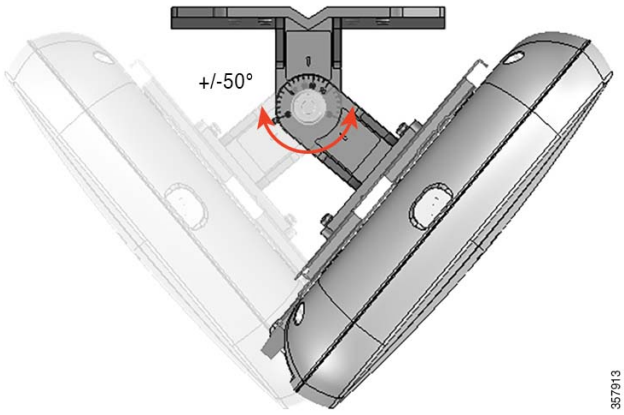


Figure 10: Single Axis Mount Pivot Adjustment



Procedure

Step 1 Determine the mounting location for the access point.

Step 2 Attach the wall mounting flange to the wall or ceiling using four M6 screws through the holes in the bracket.

Caution
The mounting surface, attaching screws, and wall anchors must support a 50 lb (22.7–kg) static weight.

Note
The mounting kit does not include the M6 screws for securing the bracket to the mounting surface.

Step 3 Attach the AIR-AP-BRACKET-2 to the access point bracket using four M4 screws through the holes in the bracket.

Hand tighten snug the four screws.

Step 4 Assemble the access point bracket to the wall mounting flange.

Hand tighten all screws and nuts. See Figure 7: Exploded View of the Single Axis Articulating Bracket Hardware Assembly, on page 13

Step 5 Attach the access point to the AIR-AP-BRACKET-2.

Use a 13-mm wrench to loosen or tighten the fasteners.

Step 6 Adjust the access point's position.

Loosen the adjustment pivot nut slightly to allow for adjustment. Use the markings on the flange bracket as a guide. You may adjust the angle ±50 degrees.

Step 7 After adjusting the access point position, tighten the pivot nut.

Tighten the nut at the pivot point to 5.6 to 5.9 lb-ft (7.6 to 8.0 Nm) torque.

Step 8 Connect the Ethernet cable to the access point.

Powering the Access Point

Caution Ensure that the AP is powered using a Underwriters' Laboratories-compliant (UL-compliant) PoE power source. You must connect the unit only to the PoE network, without routing to the outside plant.

Note Actual power consumption may vary depending on access point usage. It is recommended that you ensure that Link Layer Discovery Protocol (LLDP)/Cisco Discovery Protocol is enabled to allow proper power negotiation.

Power Source	2.4-GHz radio	5-GHz radio	6-GHz radio	Link speed	USB	Max POE power consumption
802.3bt (Class 6) (UPOE)	4x4	4x4	4x4	1x 10G	Y (9W)	39W
802.3at (PoE+)	2x2	4x4	4x4	1x 2.5 G	N	25.5W
802.3af (PoE)	-	-	-	1x 1G	N	13.95W